320.1
Extra

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

RMD

Project | Date | Author

TITLE

FOREST INSECT SURVEY REPORT OF
STIRLING CITY AND LAKE ALMANOR INFESTATION AREAS,
LASSEN AND PLUMAS NATIONAL FORESTS, SEPTEMBER 1940

Annex 1
SB
763
.C2 L3
1940c

by
S. T. Carlson
Berkeley, California
October 3, 1940

U. S. GOVERNMENT PRINTING OFFICE 8—9742

SUBJECT—

INDEX NO.—

Forest Insect Laboratory
Berkeley, California
October 3, 1940

FOREST INSECT SURVEY REPORT OF STIRLING CITY AND LAKE ALMANOR INFESTATION AREAS, LASSEN AND PLUMAS NATIONAL FORESTS, SEPTEMBER 1940.

National FS Library
USDA Forest Service

MAR 2 1 2014

240 W Prospect Rd
Fort Collins CO 80526

APPROVED BY:

J. M. MILLER
Senior Entomologist, In Charge

SUBMITTED BY:

S. T. CARLSON
Assistant Conservationist

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

FOREST INSECT LABORATORY — BERKELEY, CALIFORNIA

FOREST INSECT SURVEY

STIRLING CITY INFESTATION AREA

MT. DIABLO MERIDIAN

SCALE

LEGEND

UNIT BOUNDRY

N

INSECT LOSS ESTIMATE
SEASON OF 1940

(SURVEY SEPT. 12–22, 1940)

	TREES	MBM
PP	246	43
SP	146	260
OTHER	735	1027

	TREES	MBM
PP	480	377
SP	690	1047
OTHER	1131	245

	TREES	MBM
PP	350	545
SP	195	845
OTHER	204	320

	TREES	MBM
PP	836	508
SP	104	65
OTHER	98	155

	TREES	MBM
PP	525	894
SP	448	332
OTHER	189	832

	TREES	MBM
PP	126	82
SP	91	130
OTHER	64	98

	TREES	MBM
PP	220	242
SP	140	880
OTHER	506	343

	TREES	MBM
PP	21	4

	TREES	MBM
PP	24	19
SP	52	140
OTHER	40	38

	TREES	MBM
PP	126	87

	TREES	MBM
PP	296	204
SP	260	886
OTHER	140	46

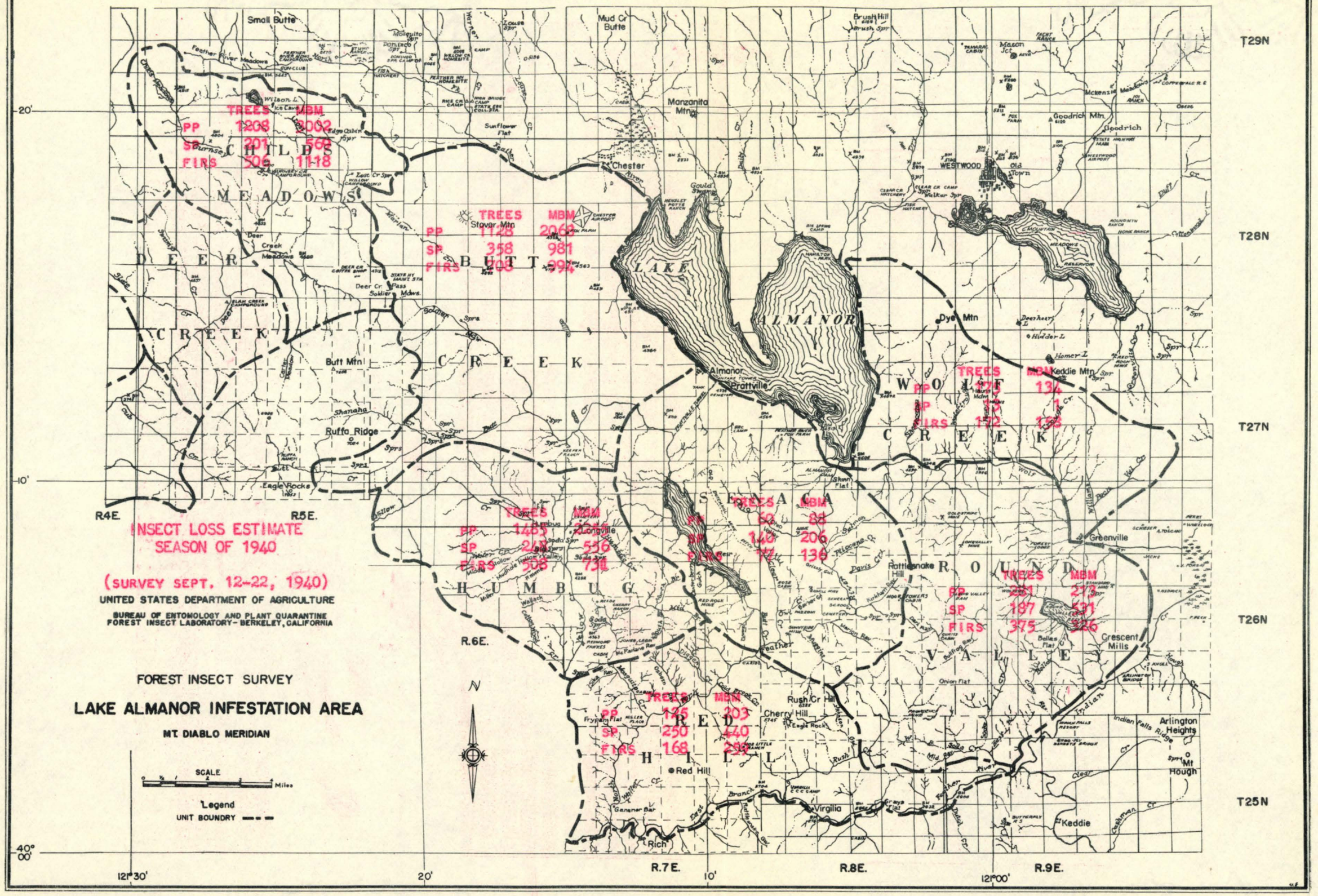
	TREES	MBM
PP	70	176
SP	39	110
OTHER	12	70

	TREES	MBM
PP	280	214
SP	60	192

T.28N. T.27N. T.26N. T.25N. T.24N. T.23N. T.22N.

R.2E. R3E. R.4E. R.5E.

40° 00' 50' 10' 40' 121°30'



	TREES	MBM
PP	1208	2002
SP	201	568
FIRS	506	1118

	TREES	MBM
PP	1128	2063
SP	358	981
FIRS	903	994

	TREES	MBM
PP		
SP		
FIRS	172	134

	TREES	MBM
PP	1483	2214
SP	248	556
FIRS	508	738

	TREES	MBM
PP	60	88
SP	140	206
FIRS	117	136

	TREES	MBM
PP	125	203
SP	250	440
FIRS	168	296

	TREES	MBM
PP	251	273
SP	187	531
FIRS	375	526

INSECT LOSS ESTIMATE
SEASON OF 1940

(SURVEY SEPT. 12-22, 1940)

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
FOREST INSECT LABORATORY - BERKELEY, CALIFORNIA

FOREST INSECT SURVEY

LAKE ALMANOR INFESTATION AREA

MT. DIABLO MERIDIAN

FOREST INSECT SURVEY REPORT OF STIRLING CITY AND LAKE ALMANOR INFESTATION AREAS, LASSEN AND PLUMAS NATIONAL FORESTS, SEPTEMBER 1940.

INTRODUCTION

A survey of the 1940 forest insect infestation conditions in the Stirling City and Lake Almanor infestation areas (maps, frontispiece) in the Lassen and Plumas National Forests was made September 12-22, 1940. This survey was carried out by Dr. DeLeon and the writer from the Forest Insect Laboratory, Berkeley, California.

EXTENT AND TYPE OF SURVEY

The survey covered a gross area of some 500,000 acres in a belt extending from marginal ponderosa pine stands on the west side near Paradise, eastward through mixed conifers to the western margin of the east side pine type on Keddie Ridge.

Estimates of current losses (Tables I, II, III, IV, appendix) have been made for the individual units in the two infestation areas. These estimates are based on (1) a general reconnaissance of the areas, (2) 188 miles of road strip samples of losses representing some 15,000 acres, and (3) a 100 percent cruise of the North half of Sec. 15, T 27 N, R 5 E (see Table V, appendix). This half section sample was first cruised by the writer in June 1940.*

INFESTATION CONDITIONS

During 1940 there has been a sharp decline in the infestation. The decline is markedly so in sugar and ponderosa pines, but somewhat less so in red and white firs. The infestation in Douglas fir has not decreased to any appreciable extent, in fact it appears to be aggressive in most of the areas where Douglas fir occurs.

Although the entire 1940 infestation on the sample plot in section 15 is not apparent at this time, comparison of the 1939 losses with those incurred so far during 1940 show an appreciable reduction for this year. Assuming that we have an additional loss of 25 percent to that already incurred in 1940, this would mean a loss decrease of 40 percent and 50 percent by volume respectively for ponderosa and sugar pine during the current year on the sample area.

The infestation is still confined to the better sites and in the mature stands of timber. Extensive top-killing and group-killing were not observed.

---

* Carlson, S. T. June 29, 1940. "Insect Reconnaissance Survey of Stirling City-Lake Almanor Infestation Areas".

INSECTS INVOLVED

The western pine beetle (Dendroctonus brevicomis Lec.) and mountain pine beetle (Dendroctonus monticolae Hopk.) are responsible for the most part for the killing of ponderosa and sugar pines respectively. Basal examinations showed that some of the sugar pines were infested with flatheads (Melanophila). Douglas firs are being killed by the Douglas fir beetle (Dendroctonus pseudotsugae) and the hemlock bark borer (Melanophila drummondi Kirby). Frequent inspections of infested trees showed a preponderance of the Douglas fir beetle.

CONDITIONS IN UNIT AREAS

I. Stirling City Infestation Area

Endemic infestation conditions prevail in Campbellville, Lone Pine, Inskip, Stirling and Paradise Units. Losses are chiefly in the ponderosa pine stands.

Deer Creek Unit: Douglas fir losses are relatively high here. The infestation is concentrated in the better sites of fir along stream courses. Group killing is general. Sugar pine losses are still significant, but are rapidly declining.

Onion Butte Unit: Although there has been a sharp decline in the infestation here, the loss of fine, large, mature sugar and ponderosa pines continues. Group killing, which was appreciable in the ponderosa pine infestation of 1939, is not manifest this year.

Polk Springs Unit: The infestation is localized in this unit to ponderosa pine on the exposed sites in Deer Creek drainage and to sugar pine in the northeastern portion of the unit.

Butte Meadows Unit: The infestation is light throughout the unit. Infestation in sugar pine is confined largely to immature trees. The Douglas fir is being heavily hit in very local areas, notably near lower Chico Meadows.

Windy Cut Unit: The infestation is relatively light throughout. Infested trees are mostly single, large and mature. Douglas fir losses are relatively light.

Last Chance Unit: The infestation is moderate, mostly mature sugar pine. The estimated loss of 60 trees per section in 1939 has dropped more than 60 percent during 1940.

Ramsey Bar Unit: The infestation is confined largely to the uncut stands where large mature trees, mostly red fir, are being killed. Losses in other species are insignificant.

Flea Valley Unit: The losses are relatively light. It is believed that removal of the infested trees through logging here has helped to keep the infestation down. Some losses are occurring in immature trees near slash concentrations along newly built logging roads.

II. Lake Almanor Infestation Area.

The sugar pine and ponderosa pine infestations are endemic in the Wolf Creek, Red Hill and Round Valley Units. The Douglas fir beetle infestation is general throughout these units, but is not serious.

Child's Meadow Unit: The infestation is general and light throughout this unit. The losses, however, are significant in that they are occurring in the most valuable trees, i.e., mature pine and fir.

Butt Creek Unit: The infestation is light, losses are moderate. They are mostly confined to large mature pine trees. Some of the larger commercially valuable Douglas fir trees are being killed also. The 1940 losses are mostly single trees in the vicinity of 1939 group kills.

Humbug Unit: The infestation is moderate, losses are mostly in single, large trees. Group kills are few except for Douglas fir.

Seneca Unit: The infestation is light and scattered, mostly of old mature trees. The intensive group killing of immature ponderosa pine trees observed in 1939 did not recur this year.

RECOMMENDATIONS

The 1940 infestation is such that direct control measures in the treating of individual trees is not recommended. Direct control is deemed unnecessary because of the declining tendency of the infestation, and furthermore the cost of control would be prohibitive if it were carried out over a sufficiently large area to be effective.

In certain units of the two infestation areas, notably Onion Butte, Deer Creek, Last Chance, Windy Cut, Child's Meadow, Butt Creek, Humbug and Seneca, where the merchantable stand is largely composed of overmature trees, insect infestations will be regarded with apprehension as long as the stand remains uncut. The insect loss of one year perhaps may not represent a large monetary value. The cumulative loss, however, over a five or ten year period during which the infestations may fluctuate as they did during the past three years, appreciably reduces the available income when the stand is liquidated by logging. Obviously, one solution would be to remove at once all of the merchantable trees. This, however, would be neither desirable nor possible from the standpoint of the lumber operators and timber owners.

Several measures are suggested in combatting the insect infestations in these areas and offsetting the loss caused by killing of merchantable trees.

1. Light selective cutting of high value or high risk trees in areas that cannot be immediately logged by the conventional methods.

2. Salvage logging of insect killed trees as soon as detected so as to prevent reduction of value through blue stain, decay, windthrow, breakage, etc.

3. Salvage logging, during the late fall and early spring months, of insect infested trees. This would be aimed at removing the insects from the area and would be equivalent to direct control with the added benefit of salvage of the infested trees.

4. Directing the normal logging operation to areas where the greatest timber values are and the most risk trees occur.

SUMMARY

A survey of the 1940 insect infestation of the Stirling City and Lake Almanor Infestation Areas, Lassen and Plumas National Forests, has been made by the Forest Insect Laboratory, Berkeley, California.

Losses of ponderosa pine, sugar pine and Douglas fir from the western pine beetle, mountain pine beetle and Douglas fir beetle respectively, rose sharply in 1937 and 1938, reaching epidemic proportions during 1939. Sugar pine losses alone in 1939 were estimated to be 200 trees or more per section in portions of Butt Creek, Humbug, Onion Butte and Last Chance Units. Estimates of the 1940 infestation indicate a sharp decline of the infestation and subsequent reduction of losses in pine to as much as 40 to 60 percent. The infestation in Douglas fir is still high, bordering on epidemic proportions in local areas. The Douglas fir infestation extends from lower Butt and Yellow Creeks northwestward to Deer Creek Meadows, thence down along Deer Creek as far as Windy Cut. The pine infestation is heaviest in Seneca, Butt Creek, Humbug, Deer Creek, Onion Butte, Windy Cut and the northeast portion of Polk Springs Unit, following and overlapping much the same area as the Douglas fir infestation.

Indirect control measures are suggested to offset losses sustained by insect attacks. They are:

1. Selective logging of high risk or high value trees.
2. Salvage logging of insect killed timber.
3. Salvage logging of currently infested trees.
4. Scheduling of normal logging operations to areas of priority based on highest risk and timber values.

TABLE I. ESTIMATED 1940 INSECT CAUSED LOSS PER UNIT AREA,
STIRLING CITY INFESTATION AREA

UNIT	TIMBERED AREA (Acres)	POND. PINE		SUGAR PINE		R. & W. FIR		INCENSE CED.		DOUG. FIR		TOTAL NUMBER TREES	TOTAL VOLUME M.B.M.
		No. Trees	Volume M.B.M.	No. Trees	Volume M.B.M.	No. Trees	Volume M.B.M.	No. Trees	Volume M.B.M.	No. Trees	Volume M.B.M.		
Butte Meadows	23,000	525	894	448	332	161	147	---	---	28	85	1,162	1,458
Windy Cut	15,000	350	545	195	845	90	192	60	8	54	140	749	1,730
Onion Butte	19,000	480	777	690	1057	95	175	13	1	23	69	1,301	2,079
Polk Springs	10,000	336	502	104	655	40	78	10	1	48	76	538	1,312
Campbellville	15,000	126	82	91	130	34	32	---	---	30	66	281	310
Lone Pine	20,000	84	19	52	140	40	38	---	---	---	---	176	197
Inskip	15,000	21	4	---	---	---	---	---	---	---	---	21	4
Stirling	30,000	126	87	---	---	---	---	---	---	---	---	126	87
Last Chance	14,000	220	242	440	880	440	308	22	9	44	26	1,166	1,465
Ramsey Bar	20,000	196	204	260	886	100	264	20	6	20	194	596	1,554
Flea Valley	10,000	70	176	39	110	10	30	---	---	12	40	131	356
Paradise	25,000	280	214	60	192	---	---	---	---	---	---	340	406
Deer Creek	16,000	246	431	146	260	224	288	11	21	500	718	1,127	1,718
TOTAL	232,000	3060	4177	2525	5487	1234	1552	136	46	759	1414	7,714	12,676

TABLE II. ESTIMATED 1940 INSECT CAUSED LOSS PER ACRE BY UNITS, STIRLING CITY INFESTATION AREA

UNIT	PONDEROSA AND SUGAR PINE		OTHER SPECIES*		ALL SPECIES	
	No.Trees	Vol.B.F.	No.Trees	Vol.B.F.	No.Trees	Vol.B.F.
Butte Meadows	n0.04	53	0.008	10	0.05	63
Windy Cut	0.04	93	0.02	23	0.06	116
Onion Butte	0.06	97	0.007	13	0.07	110
Polk Springs	0.04	116	0.01	15	0.05	131
Campbellville	0.01	14	0.004	7	0.01	21
Lone Pine	0.006	7	0.002	2	0.01	9
Inskip	0.001	0.3	---	--	0.001	0.3
Stirling	0.004	3	---	--	0.004	3
Last Chance	0.05	80	0.04	25	0.09	105
Ramsey Bar	0.05	54	0.007	23	0.06	77
Flea Valley	0.01	29	0.002	7	0.01	36
Paradise	0.01	16	---	--	0.01	16
Deer Creek	0.02	43	0.05	64	0.07	107

* Includes Red Fir, White Fir, Incense Cedar and Douglas Fir.

TABLE III. ESTIMATED 1940 INSECT LOSS PER UNIT AREA,
LAKE ALMANOR INFESTATION AREA

UNIT	TIMBERED AREA (Acres)	POND.& JEF. P.		SUGAR PINE		R.& W. FIR		INCENSE CED.		DOUG. FIR		TOTAL NUMBER TREES	TOTAL VOLUME M.B.M.
		No. Trees	Volume M.B.M.	No. Trees	Volume M.B.M.	No. Trees	Volume M.B.M	No. Trees	Volume M.B.M	No. Trees	Volume M.B.M.		
Child's Meadow	23,000	1208	3002	201	569	506	1118	---	---	---	---	1,915	4,689
Butt Creek	22,000	1128	2068	358	981	550	867	---	---	158	127	2,194	4,043
Humbug	18,000	1485	2255	248	556	162	236	---	---	346	495	2,241	3,542
Seneca	16,000	60	88	140	206	---	---	---	---	77	136	277	430
Round Valley	25,000	281	213	187	531	225	203	---	---	150	123	843	1,070
Wolf Creek	10,000	175	134	13	1	100	88	---	---	72	70	360	293
Red Hill	20,000	125	203	250	440	---	---	---	---	168	259	543	902
TOTAL	134,000	4462	7963	1397	3284	1543	2512	---	---	971	1210	8,373	14,969

TABLE IV. ESTIMATED 1940 INSECT CAUSED LOSS PER ACRE BY UNITS, LAKE ALMANOR INFESTATION AREA

UNITS	JEFFREY, PONDEROSA & SUGAR PINE		OTHER SPECIES		ALL SPECIES	
	No.Trees	Vol.B.F.	No.Trees	Vol.B.F.	No.Trees	Vol.B.F.
Child's Meadow	0.06125	155	0.0275	61	0.08875	216
Butt Creek	0.0675	139	0.0322	45	0.0997	184
Humbug	0.0960	156	0.028	41	0.124	197
Seneca	0.0125	18	0.005	9	0.013	27
Round Valley	0.0187	22	0.015	13	0.034	35
Wolf Creek	0.0188	14	0.017	16	0.036	29
Red Hill	0.0187	32	0.008	13	0.027	55

TABLE V. MEASURED 1939-1940* LOSS, NORTH HALF SEC. 15, T 15 N, R 3 E, MDM

TREE SPECIES	NUMBER OF TREES		VOLUME BOARD FEET		NO. TREES PER ACRE		VOLUME B.F. PER ACRE	
	1939	1940*	1939	1940*	1939	1940*	1939	1940*
Ponderosa Pine	22	11	62,000	28,000	0.068	0.034	194	88
Sugar Pine	35	25	86,000	27,000	0.109	0.078	268	84
Red & White Fir	16	14	24,000	18,000	0.050	0.043	75	56
Incense Cedar	--	1	--	1,000	---	0.003	--	3
Douglas Fir	1	1	3,000	1,000	---	0.003	9	3
TOTAL	74	52	175,000	75,000*	0.227	0.161*	547	234*

* Final 1940 loss cannot be determined until all infested trees show up, which would be about June 1941. These estimates for total 1940 loss are subject to a modification of ± 25%, depending on the number of trees in the winter generation which were not in evidence at the time of this survey.